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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/674,583	02/05/2001	Hongchang Bao	450108-02391	1517
20999	7590	04/28/2005	EXAMINER	
FROMMER LAWRENCE & HAUG 745 FIFTH AVENUE- 10TH FL. NEW YORK, NY 10151			OPSASNICK, MICHAEL N	
			ART UNIT	PAPER NUMBER
			2655	

DATE MAILED: 04/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/674,583

Applicant(s)

BAO, HONGCHANG

Examiner

Michael N. Opsasnick

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/21/2005 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang (6188982) in view of Errell et al (5778342).

The U.S. patents of Chiang and Errell et al. teach computer-based apparatuses (systems) and hence the methods and computer code necessary to implement these systems are inherently part of Chiang's and Errell et al.'s references.

The examiner interprets all claims reciting, "state that said data do not exists" as references to a state of silence/noise, when speech is not present in the signal.

As per claims 1, 6-8, Chiang discloses:

- extracting means for extracting feature vectors (distributions) from input speech (elem. 11, FIG. 3). The speech recognizer will necessarily convert input speech to feature vectors.
- Storing means for classification models (Hidden Markov Models) (HMMs, elem. 18, FIG. 3).
- Classifier circuit (elem. 22, FIG. 3) for the extracted feature vectors. (Abstract).
- Parallel Model Combination (PMC) circuit (elem. 16, FIG. 3) for generating and storing adapted (updated) HMMs (elem. 14, FIG. 14) based on the noise extracted from the immediately collected input data (Col. 4, lines 5-7).

Chiang does not disclose extracting noise from input just preceding the input of speech data, however, Erell et al. teaches extracting background noise speech vector right before speech utterance is spoken. (Col. 6, lines 9-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify

Chiang as taught by Errel. et al. in order to get the clean estimation of the background noise signal because at that time right before utterance is spoken only the noise signal is present in the input data and the resulting noise estimation is much more reliable (Errel, abstract, col. 6 lines 9-12).

As per claims 2 and 3, the examiner has interpreted them as reciting that silence (noise) is a normal (Gaussian) process, and that the estimate of the average of the frame features has a mean (claim 2 and 3) and variance (claim 2) obtained, respectively, by summing the frame feature means, and by summing their respective variances (the latter being the sum of squared frame mean estimates minus the sum of the squared of the means, statistical independence of the features and time-invariant frame statistical properties having been assumed). Gaussian (normal) noise distributions were assumed by Chiang in his PMC model (Col. 4, lines 48-51), and the above mean and variance relationship inherently follow (see the sample MLE tutorial reference, Eq. 26 and 27 - reviewing standard statistical results, wherein  $T_i$  is interpreted as the frame feature mean), since the summed frame noise mean estimates are independent random variables.

As per claim 4, Chiang discloses the use of linear interpolation for re-estimation of noise model (Eq. 6 and Col. 4, lines 54-64).

As per claim 5, Chiang discloses the use of PMC which performs the "sum of statistical populations" of noise and clean speech portions of the overall signal because of the independent properties of speech and noise signals (FIG. 2).

***Response to Arguments***

4. Applicant's arguments filed 3/21/2005 have been fully considered but they are not persuasive. As per applicant's arguments with respect to 103, examiner notes that under 35 U.S.C. 103, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP § 2143 - § 2143.03 for decisions pertinent to each of these criteria. Of these requirements, applicant has challenged "demonstration of a reasonable expectation of success". Furthermore, Applicant argues that the combination of Chiang (6,188,982) and Erell et al. (5,778,342) would not have been obvious to one of the ordinary skill in the art because Chiang teaches that it would be undesirable to have to collect background noise in advance (Col. 3, lines 53-60). However, MPEP 2123 states: "a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art; including nonpreferred embodiments. Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). See also Celeritas Technologies Ltd. v. Rockwell International Corp., 150 F.3d 1354, 1361, 47 USPQ2d 1516,1522-23 (Fed. Cir.

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1998) (The court held that the prior art anticipated the claims even though it taught away from the claimed invention." The fact that a modem with a single carrier data signal is shown to be less than optimal does not vitiate the fact that it is disclosed."). Here, Chiang's background references disclose collecting background noise in advance and using it for model adaptation (Col. 3, lines 45-53). To one of ordinary skill in the art, this passage would clearly suggest that a modification of Chiang's system with a preliminary noise collection step (such as the one taught by Ereli et al) is at least possible, if not desirable (furthermore, undesirable is quite different from "reasonable expectation of success"). This is further supported by Chiang who teaches that the conventional PMC model (which collects background noise in advance) is effective against additive noises in stationary environments (reasonable expectation of success → Col. 3, lines 45-48). Hence, the resulting combination of Chiang and Ereli et al. may not have all of the advantages of the on-line PMC method taught by Chiang, but it is nevertheless a viable alternative that was suggested by Chiang's disclosure and is an effective solution for reducing additive noises in stationary environments (Col. 3, lines 45-48). In closing, applicant's assertions on the bottom of page 7 are incorrect, since applicant addressed one criteria of obviousness (not two as mentioned on the bottom of page 7), nonetheless, the three requirements of obviousness have been met by the office action submitted above.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please see related art listed on the PTO-892 form.

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**6. Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 872 9314,

(for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,  
Arlington, VA., Sixth Floor (Receptionist).

**7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Opsasnick, telephone number (571)272-7623, who is available Tuesday-Thursday, 9am-4pm.**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Mr. David Ometz, can be reached at (571)272-7593. The facsimile phone number for this group is (571)272-7629.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 2600 receptionist whose telephone number is (571) 272-2600, the 2600 Customer Service telephone number is (571)272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mno

*Michael Opsasnick*  
4/25/05